

Bubble Sort

Example 4 items ($n = 4$)

dcba	cdba	cbda	cbad	pass 1
cbad	bcad	bacd	bacd	pass 2
bacd	abcd	abcd	abcd	pass 3

To bubble sort n items requires $n-1$ passes
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In each pass, there are $n-1$ comparisons

A bubble sort is an $\text{order}(n^2)$ algorithm. That is, for 100 items, there are 100×100 operations = 10,000 operations. This is very inefficient!

Example 5 items ($n=5$)

edcba	decba	dceba	dcbea	dcbae	pass 1
dcbae	cdbae	cbdae	cbade	cbade	pass 2
cbade	bcade	bacde	bacde	bacde	pass 3
bacde	abcde	abcde	abcde	abcde	pass 4

Algorithm:

Assume we have an unsorted array of dimension n
eg. dim unsorted(1 to 100) as string

For n = 100, 99 passes

For pass = 1 to 99

for compare = 1 to 99

Compare first and second item.

If first is out of order, swap first and second items

repeat previous two steps until we get to the 99th and 100th item

next

next

For pass = 1 to 99

for compare = 1 to 99

'Compare current item with next item

If unsorted(compare) > unsorted(compare+1) then

'If current item is out of order, swap with next item

temp = unsorted(compare)

unsorted(compare) = unsorted(compare+1)

unsorted(compare+1) = temp

end if

next 'repeat previous two steps until we get to the 99th and 100th item

next